Map Unit Descriptions

Source: Rader, E.K., and Evans, N.H., editors, 1993, Geologic Map of Virginia – Expanded Explanation: Virginia Division of Mineral Resources, 80 p.

PzYgr granite gneiss (Pavlides, 1990). Fine- to medium-grained, light-gray to white granite to tonalite gneiss; composed of biotite, oligoclase, quartz, and porphyroblastic microcline, with accessory muscovite, epidote, titanite, and magnetite; hornblende occurs locally within diffuse compositional layering. Inclusions of biotite gneiss and amphibolite are present locally. Unit occurs as irregular lenticular to tabular masses within porphyroblastic biotite gneiss (Ymd).

PzYpm quartzofeldspathic gneiss (Bobyarchick and others,1981). Light-gray, fine- to coarse-grained, foliated, layered muscovitie-bearing quartzofeldspathic gneiss; contains intercalated quartz-muscovite schist. Mineralogy: quartz + plagioclase + microcline + garnet + muscovite + biotite.

pbg porphyroblastic granite gneiss: Light-gray, medium to coarse-grained, compositionally layered, well-foliated, commonly lineated gneiss composed of metamorphosed granite, leucogranite, and granodiorite, which locally contains feldspar megacrysts. This unit includes the granite at Lawrenceville; the rocks are variably mylonitic and lineated along the Lake Gordon mylonite zone near Kenbridge (Horton and others, 1993).

fg gneissic granite and granodiorite. Light-gray to white, fine- to medium-grained, massive to foliated, muscovite-biotite gneissic granite to granodiorite containing minor garnet, and xenoliths of biotite gneiss and amphibolite. Several different intrusive phases are present.

rbg biotite gneiss. Light-gray, medium- to coarse-grained, compositionally-layered and locally migmatitic rocks, in clude interlayered biotite gneiss, muscovite-biotite gneiss, muscovite-biotite schist, and sillimanite-mica schist; also includes minor interlayers and lenses of granitic gneiss, biotite-amphibole gneiss, amphibolite, garnet-mica schist, calcsilicate granofels, and rare ultramafic rocks. This unit correlates with Raleigh belt rocks in North Carolina (Parker, 1979; Geologic Map of North Carolina, 1985).

bgr Burkeville pluton. Grayish-blue, fine- to medium-grained, massive to faintly foliated; composition ranges from granodiorite to monzonite.
Mineralogy: oligoclase + microcline + quartz + biotite + epidote + apatite + zircon.
Geophysical signature: diffuse pattern of negative magnetic and circular positive radiometric anomalies.
The pluton was originally referred to as the Burkeville granite (Husted, 1942), and is the "granite in the Burkeville granite quarry" of Steidtmann (1945); the pluton intrudes migmatitic paragneiss (mpg).

fgb biotite granite gneiss. Light-gray, medium-grained, equigranular, broadly-layered, locally migmatitic.
Mineralogy: quartz + plagioclase + microcline + biotite + muscovite + hornblende; apatite and zircon are accessory minerals.
Geophysical signature: diffuse pattern of positive radiometric anomalies.

amr amphibolite and amphibole-bearing gneiss and schist. Dark-gray to black, medium-grained, strongly foliated and lineated.
Mineralogy: hornblende+plagioclase+biotite+quartz+epidote; apatite, titanite, and magnetite are accessory minerals.
Geophysical signature: strike-elongate positive magnetic anomalies.
These rocks are interlayered with migmatitic paragneiss (mpg).

mpg migmatitic paragneiss. Leucocratic to mesocratic, medium- to coarse-grained layered gneiss contains interlayered biotite-rich and quartzofeldspathic zones, locally migmatitic; includes lesser amounts of biotite schist, muscovite schist, and thin lenticular amphibolite bodies.
Mineralogy: biotite + muscovite + plagioclase + potassium feldspar + garnet ± hornblende.

Ya amphibolite, amphibole gneiss, and schist. Melanocratic, fine- to coarse-grained, weakly to strongly foliated, irregularly layered amphibole-rich gneiss and schist.
Mineralogy: hornblende + clinopyroxene + plagioclase + magnetite + biotite ± scapolite ± garnet ± quartz ± epidote. Geophysical signature: narrow, strike-elongate, positive magnetic anomaly.
Lenses and layers of amphibolite and amphibole gneiss are interlayered with porphyroblastic garnet-biotite gneiss (Ymd). The mafic rocks constitute 50 percent or more of the section in a zone about 0.62 mile wide surrounding outcrop areas of State Farm gneiss (Ysf); farther away from the State Farm contact, lenses and layers of amphibolite and amphibole gneiss are more widely scattered, but are laterally persistent and outline map-scale structures (Marr, 1985). Amphibolite and interlayered biotite gneiss adjacent to the State Farm gneiss were named the Sabot amphibolite by Poland (1976), who characterized the formation as a tabular sheet 0.7 to 1.0 km thick. He and Goodwin (1970) interpreted these amphibolites as metamorphosed mafic volcanic or pyroclastic rocks. Glover and others (1989 and references therein) report a low-angle regional discordance between the base of the Sabot and the compositional layering in the underlying State Farm Gneiss.

Ymd porphyroblastic garnet-biotite gneiss. Heterogeneous layered sequence is dominantly garnetiferous biotite gneiss and porphyroblastic gneiss, migmatitic in part, with subordinate interlayered amphibolite and amphibole gneiss (Ya), pelitic-composition gneiss, calcsilicate gneiss, biotitehorn blende-quartz-plagioclase gneiss, and garnetiferous leucogneiss. These lithologies contain amphibolite-facies metamorphic mineral assemblages consistent with rock chemistry. Farrar (1984) reports relict granulite-facies assemblages in some rocks.

This unit underlies a wide area that surrounds the State Farm antiform (Poland, 1976; Reilly, 1980; Farrar, 1984) and two subsidiary antiforms to the northeast; the unit includes the Maidens gneiss and portions of the Sabot amphibolite of Poland (1976), the eastern gneiss complex and Boscobel granodiorite gneiss of Bobyarchick (1976), and the Po River Metamorphic Suite of Pavlides (1980).
Poland (1976) and Reilly (1980) proposed that the Maidens gneiss and Sabot amphibolite were a Late Precambrian- to Early Paleozoic-age volcanic-sedimentary cover sequence unconformably overlying the State Farm gneiss. Farrar (1984) interpreted relict granulite-facies mineral assemblages to have equilibrated during Grenville-age regional metamorphism; this contributed to his conclusion that the Sabot and Maidens, in addition to the State Farm, are Grenville or pre-Grenville in age.
Porphyroblastic garnet-biotite gneiss (Ymd) is intruded by rocks of the Carboniferous-age Falmouth Intrusive Suite (Pavlides, 1980).

Zlv layered mafic to felsic metavolcanic rocks. Volcanogenic sequence includes felsic pyroclastic and volcaniclastic rocks with intercalated mafic pyroclastic and amygdaloidal flows and phyllitic metasedimentary interbeds. Felsic rocks are crystal, lithic, and vitric tuff and tuff breccia ranging in composition from rhyolite to dacite. Mafic rocks consist of mafic lithic crystal and vitric tuff, with associated amygdaloidal pyroclastic rocks, and greenstone metabasalt.

my mylonite. Includes protomylonite, mylonite, ultramylonite, and cataclastic rocks. Lithology highly variable, depending on the nature of the parent rock, and on intensive parameters and history of deformation. In most mapped belts of mylonite and cataclastic rock (my), tectonized rocks anastomose around lenses of less-deformed or undeformed rock. In the Blue Ridge, some of these lenses are large enough to show at 1:500,000 scale. In many places mylonitic and cataclastic rocks are gradational into less deformed or undeformed adjacent rocks, and location of contacts between tectonized rocks (my) and adjacent units is approximate or arbitrary. These boundaries are indicated on the map by color-color joins with superimposed shear pattern.
Most mapped belts of mylonite represent fault zones with multiple movement histories. In the Blue Ridge, Paleozoic age contractional deformation fabrics are superimposed on Late Precambrian extensional fabrics (Simpson and Kalaghan, 1989; Bailey and Simpson, 1993). Many Piedmont mylonite zones contain dextral-transpressional kinematic indicators that formed during Late Paleozoic collisional tectonics (Bobyarchick and Glover, 1979; Gates and others, 1986). Paleozoic and older faults were reactivated in many places to form extensional faults during the Mesozoic (Bobyarchick and Glover, 1979).

d diabase (Lower Jurassic). Fine- to coarsely-crystalline,subaphanitic or porphyritic with aphanitic margins; dark-gray mosaic of plagioclase laths and clinopyroxene, with some masses characterized by olivine or bronzite, others granophyric. Also occurs as dikes and sills in the Valley and Ridge, Piedmont, and Blue Ridge physiographic provinces.